

**EXHIBIT 2**  
**[UNREDACTED VERSION OF  
DOCUMENT SOUGHT TO BE SEALED]**

# Grenada SAD Approval 10/18/11

Grenada Core Team

Seagate Technology



Grenada Core Team is presenting the following package for your approval for SAD release of the full family of Grenada drives utilizing only the BP4.5 22A HGA's. We present this request with only the exception of a potential material shortfall if Alphana 1D MBA WIP does not get requalified. Requalification in progress with cleanliness actions by the vendor and new PWM frequency, expected timeout 10/24 (risk decision)-10/31.

If you have any questions or concerns please contact Pat Dewey or a member of the Grenada Core Team.

Go Grenada!



**Confidential**

Page 2



# Grenada Configuration

## SAD Configuration:

- SAD Firmware - GR75.AW01AD.CCD4 and Servo 8B or greater (GR75.AW01AD.CCD4 and Servo 8B)
- Material: Customer base
  - PCO12.6 or greater
  - RHO: BP4.5 with 22A DLC
  - No Compart hook-ups, component not visible to the customers
  - No external bath processed HSA's, process not visible to the customers
  - Media: G5B or greater; No RMO Sputter SV615, SV616, until re-qual
  - Motor: Nidec, Alphana 2D & 3D, 1D after re-qualification
  - PreAmp: LSI, TI
  - Servo: McKinley XL ST, TI
  - DDR2: Winbound, Hynix, Samsung, Elite, Nanya
  - Material from the config plan
  - Korat, Wuxi, Suzhou



## SLAM Milestone Assessment

<b>7. Pilot</b>		Product:	Grenada					
		Report Date:	10/13/2011					
Functional Organization	Deliverables	Criteria	Last Update	Current Status	Risk	Owner	Closure Date	Comments/Actions
<b>1. Milestone Criteria</b>	168-Hr DPPM Goal Achieved	<5K DPPM	10/14/2011	NA	Low Risk	Glen D Almgren		
	All contract items are within variance and projected to remain so		10/13/2011	Achieved	Low Risk			Reviewed with SMT 20 Sept, slide 27 = Contract variances are: = 1. Drive budget 45K over budget = 2. CTU declare date projected to 12 Oct 2011 +150days = 3. Gen2 declare was 18 Mar 2011 +90days
	Complexity Health Index - Does not deviate from Phase 0 Contract	A. CH Index Score = 90 against budget of 296 B. CC Budget = 80, forecast 54	04/21/2011	Achieved	Low Risk	John Mortellaro		complete
	Component sources defined on the SSP approved to AML level AB. Exceptions have defined/underpinned closure plans. Qualified Sources can support Master Schedule Requirements.	Need Alphana qualified for 1D MBS. Alphana DQ'ed due to skip write failures in RDT3	10/17/2011	Potential shortfall to current MBS for 1D MBA!	Med Risk	Bob Kolanda/Mike Kepler		800K MBA's of 1D Alphana available contingent on requal effort in progress. Risk decision on 10/24 and 10/31. Retesting with CA's in progress 10/17.
	Exceptions to previous Phase Review closed		03/04/2011	Not Posted	No Risk Assigned			
	Factory Prime Yields meet Phase 0 goal =	Actual = 73% 1D, 59% 2D, 56% 3D, Goal 65% 1D	10/14/2011	Achieved	Low Risk	Kevin Stenvall		
	Firmware/Compatibility Testing Complete = - All High Risk items fix validated.		10/14/2011	Achieved	Low Risk	Matt Sadafi		
	Gen 2/3 Product Assurance and Factory Testing Complete = - All High Risk items fix validated.		10/14/2011	Achieved	Low Risk	Glen D Almgren		
	Integration DPPM Goal Achieved	Requirement 2k. Achieved 1.43k	10/14/2011	Achieved	Low Risk	Glen D Almgren		
	Inventory / Material Disposition = - Complete roll-up of all Factory and DC pre-SAD config inventory/WIP/FG and Disposition		10/03/2011	Achieved	Low Risk	Bob Kolanda		
	MTBF Goal Achieved	SAD = 250K, Actual = 248K	10/14/2011	Achieved	Low Risk	Glen D Almgren		MTBF Goal expected to meet 250K and 1K hours RDT3 10/17!
	Process Readiness Audit and Process Verification Test Results approved by the Volume Factory and Design Center. = - Includes QA Hardware/Software Readiness = - Includes Rework Qualification		04/27/2011	Achieved	Low Risk	Kevin Stenvall		
	Product Stewardship Declaration of Compliance at a minimum of 95% completed.		04/22/2011	Achieved	Low Risk	Bob Kolanda		
	SLAM Deliverables completed and entered into ADD/DD database.		10/14/2011	In Progress	Low Risk	Pat Dewey	10/17/2011	MTBF



**Approval Date: October 18 , 2011**

**Goal: Authorizes Shipments of all configurations**

**Configuration: 750G, 1TB, 1.5TB, 2.0TB, 2.5TB, 3.0TB SATA**

Pat Dewey  
Pat Dewey  
Core Team Lead

Brent VanDerVliet  
Brent VanDerVliet  
Exec Dir Proj Eng

Frank Murphy  
Frank Murphy  
Dir Bell

Mike Kepler  
Mike Kepler  
Exec Dir Materials

Geoff Gorbould for TM  
Tom Major (acting)  
SVP, PLM

Mike Foye  
Mike Foye  
Ex Dir, TCM

Val LaRoche  
Val LaRoche  
Sr. Dir. Finance

Kian Fatt Chong  
Kian Fatt Chong  
VP Mfg

Jeff Mason  
VP Design Engineering

Andy Davis  
Andy Davis  
SVP, LCO Design Engineering

John Griedl  
John Griedl  
SVP, Customer Advocacy

Grenada RDT 3/4			Updated: 10/17/11 12:00 AM		
AFR (1st year Weibull)	2.621%	From all fails Weibull MLE	1360	QTY TESTED	
MTBF (1st year Weibull)	90371.8				
Minimum AFR:	0.039%	From zero fail Weibull @ 50% CL	2400	POH/Year	
Total Number of Failures	47		0.63955018	Weibull Beta	
AFR for 1 failure	0.055%	AFR decrease per failure @ 100% fix effectiveness	953	Average Test Hours	

Issue	Corrective Action	Fix Validation	# of Failures	% Fail	Eff. Factors		Reduced AFR		PFL/TF
					Demo'd	Potential	Demo'd	Potential	
SPPL-110: Skip Write Due to Contamination on Alpha-1D Configuration	SSD For Alpha 1Disk Configuration in place on 9/20	1D / Alpha SSD in place in the factory on 9/19	18	0.989%	100%	100%	1.687%	1.687%	PFL-2232/339,PFL-2231/823,PFL-2226/332,PFL-2305/680,PFL-2086/64,PFL-2016/160,PFL-2201/689,PFL-2114/436,PFL-2199/410,PFL-2064/10,PFL-2060/268,PFL-2034/189,PFL-2193/321,PFL-2157/553,PFL-2170/293,PFL-2092/373,PFL-2091/94,PFL-2332/736
SPPL-108: 20kHz Loop Instability due to Incorrect SNO & TAN	3 Code Fixes Planned: 1. TAN Improvements. 2. SNO Picks in the process 3. Broad notch between 18-22	Validation in process on 10 failures.	10	0.549%	100%	100%	2.126%	2.126%	PFL-2082/88,PFL-2081/245,PFL-2033/141,PFL-2057/190,PFL-2056/172,PFL-2024/174,PFL-2026/112,PFL-2014/80,PFL-2015/63,PFL-2309/918
SPPL-111: Degraded Head - RDT 3,4,5	3 of 4 Deg Heads have TA interaction. TA/Defect reduction plan in process with RMO. PFL2074: Combination Spec for TA Count + P_AFH_DH_BURNISH_CHECK - PCO 16.1 on ww1		5	0.275%	0%	40%	2.621%	2.511%	PFL-2314/887,PFL-2205/666,PFL-2074/265,PFL-2058/242,PFL-2195/577
SPPL-113: Particle Induced Media Damage	Improved General Cleanliness Actions and MQM change for Bode shake as part of particle sweep in CRT2 on 6 Head only.		3	0.165%	0%	20%	2.621%	2.588%	PFL-2127/412,PFL-2197/590,PFL-2002/73
SPPL-117: Skip Write - RDT 3/4/5	Skip Write Detect sensitivity adjustment. ww14 for testing. One skip write easily caught with a negative burnish spec in cert. Discussing implementation. Particle Improvements for contamination related skip write		3	0.165%	0%	40%	2.621%	2.555%	PFL-2256/756,PFL-2159/535,PFL-2198/645
Modulation	FA In Process		1	0.055%	0%	0%	2.560%	2.566%	PFL-2322/755,PFL-2321/736
SPPL-116: SWOT - RDT 3/4/5	Servo code xxx8C		2	0.110%	0%	80%	2.621%	2.533%	PFL-2061/176,PFL-2148/438
SPPL-105: Weak Write - Process Escape with PCO13 Not Reporting Data	Fix for PCO13 not reporting all heads in the IOSC2 Weak Write screen	Validated fix is in PCO 12.4	1	0.055%	100%	100%	2.566%	2.566%	PFL-1956/0
SPPL-109: Head Instability due to Interaction with FAFH Tracks	Remove FAFH Tracks in PCO 12.4	Drive Passed Retest. Head will go to RHO for further FA	1	0.055%	40%	40%	2.599%	2.599%	PFL-1999/31
SPPL-114: IOEDC due to incorrect VBM Index	New 'bread crumb' code developed to dump out ECC fields. Have not performed board swap piece (winbond DRAM) Customer data not lost Drive is retesting with debug co		1	0.055%	0%	0%	2.621%	2.621%	PFL-2070/31
SPPL-118: Seek Timeout due to incorrect ACFF coeff during Single to Dual Stage Transition	Servo code xxx8B that blends the integrator value when transitioning from Single to Dual stage.	Validation on failures from RDT3/4/5	1	0.055%	90%	100%	2.571%	2.566%	PFL-2150/259
SPPL-119: Weak Write - RDT 3,4,5	VBAR by HMS Phase 4		1	0.055%	0%	40%	2.621%	2.599%	PFL-2137/452
Total Number of Fails			47	Reduced AFR :		0.95%	0.63%		
				Corresponding MTBF :		251K	378K		



Confidential

Page 6



HIGHLY CONFIDENTIAL

FED\_SEAG0026844

# DPPM Update

## Grenada ODT Dppm

Sample Date	VWV1201	VWV1202	VWV1203	VWV1204	VWV1205	VWV1206	VWV1207	VWV1208	VWV1209	VWV1210	VWV1211	VWV1212	VWV1213	VWV1214
Qty Tested (Combined)	2841	4985	9563	3045	5459	4021	5063	5280	4354	2515	1751	2127	204	3596
No. of Failures	7	7	19	12	23	5	16	15	11	2	5	3	0	10
Weekly DPPM	2464	1404	1987	3941	4213	1243	3160	2841	2526	795	2856	1410	0	2781
4 Week MAV DPPM	3262	2939	2332	2202	2646	2671	3184	2976	2511	2556	2374	1954	1516	2344

## Grenada ODT Dppm exclude Seek timeout from PC012.4

Sample Date	VWV1201	VWV1202	VWV1203	VWV1204	VWV1205	VWV1206	VWV1207	VWV1208	VWV1209	VWV1210	VWV1211	VWV1212	VWV1213	VWV1214
Qty Tested (Combined)	2841	4985	9563	3045	5459	4021	5063	5280	4354	2515	1751	2127	204	3596
No. of Failures	7	7	19	12	23	5	16	15	11	2	5	3	0	3
Weekly DPPM	2464	1404	1987	3941	4213	1243	3160	2841	2526	795	2856	1410	0	834
4 Week MAV DPPM	3262	2939	2332	2202	2646	2671	3184	2976	2511	2556	2374	1954	1516	1433







# Back up

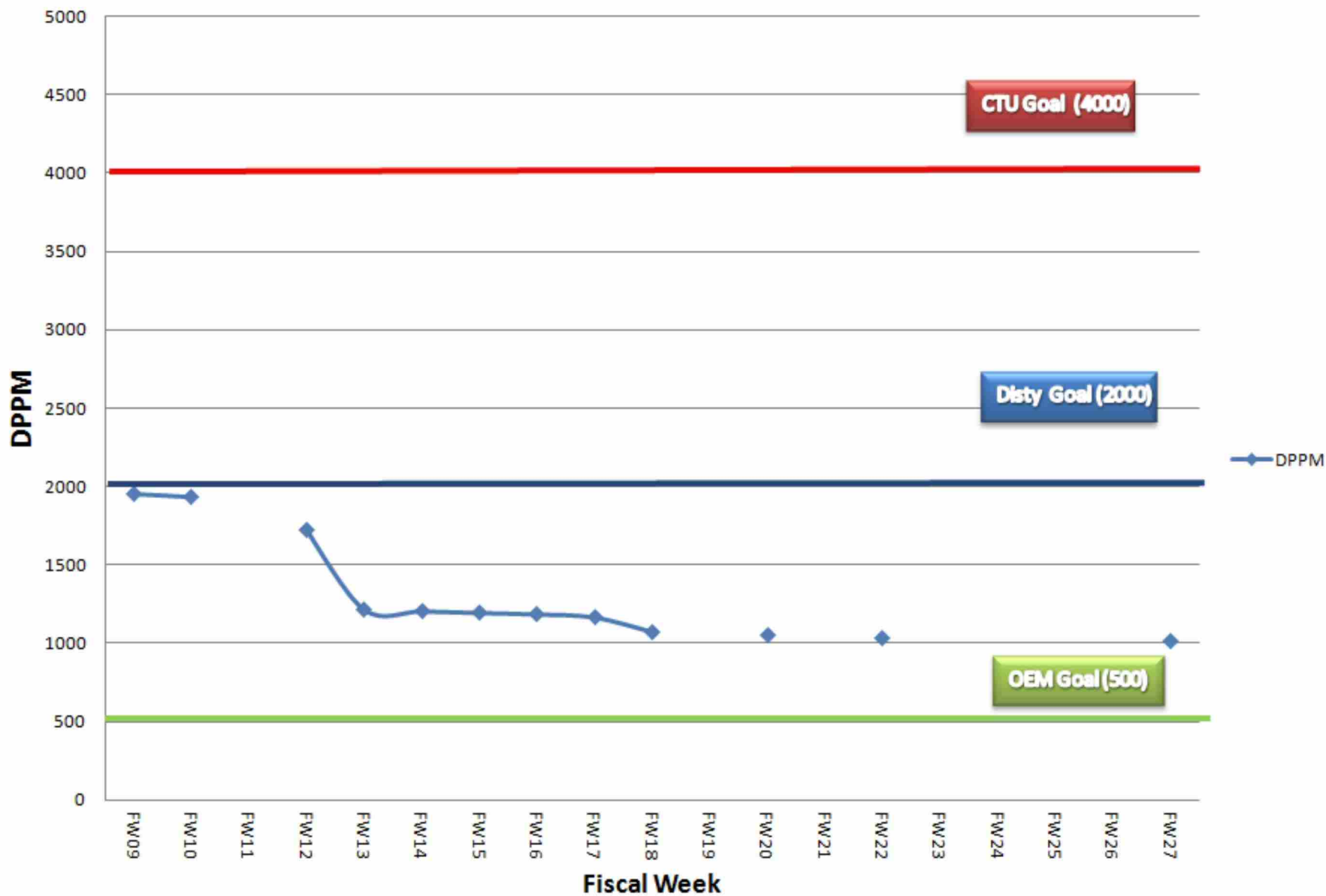


Failure mode	Number of failures/ DPPM	Improvement plan.	PCO	Champion	Prior	FW13	FW14	FW15	FW16	FW17	FW18	FW19	FW20	FW21	FW22	FW23	FW24	FW25	FW26	FW27
Modulation	5 / 465			Sandeep																
		1) Post process Skip write detect. Retry if modulation present	PCO12.4		FW10															
		2) 20Khz fixes SNO and TAN fix	PCO 14.1			418														
Weak Write	3 / 279			Krishnan																
		1) New HGA spec			FW12/ 25															
		2) New triplets	PCO 12.4+		FW10 /20															
		3) VBH4 with settling spec	PCO14.1+			209														
Skip Write	2 / 186																			
		1) Remove Alphana 1D		Core team		30														
		2) Moving the calibration to after ZAP in FNC2 may help a little	PCO14.1+	Koldewyn		33														
		3) Increasing the sensitivity since the last calibration change to prevent throughput issues lost some....		Koldewyn		30														
SWOT	2 / 186			David Olivero		0														
		Mechanical: SWOT sensor on PCCA																		
		External: revisit Shock sensor sensitivity																		
NTF	2 / 186					0														
Erasure	2 / 186																			
		Particle Improvement		Scott Diets		9	9	9	9	9			9		9					9
NMD	1 / 93																			
		1) Particle improvement plan		Scott Diets		10	10	10	10	10			10		10					10
		2) Particle sweep on 50% of 6-hdrs	PCO14.2	Scott Diets																
		3) UDR (need improvement measurement, GIO script)		Glen A.																
EAW	1 / 93			Krishnan		0														
		New Spec	PCO 16								93									
Sync Defect	1 / 93			Kelvin Mow		0														
		Underinvestigation	TBD																	
RAM Miscompa	1 / 93					0														
		Underinvestigation	TBD																	
Others	1 / 93					0														
Total DPPM	1954					1720	1215	1205	1195	1185	1166	1073		1054		1035				1016

- EAW Spec change should catch this Failure, implementation date PCO 16.X 6 Wks out
- Sync\_PLL Defect is being looked at By Kelvin Mao. TBD
- IOEDC: Board swap and retest with miss compare Beat-up. Try the IOEDC code. ECD FW14



# ORT DPPM Progression per FW



Grenada RDT 3/4			Updated: 10/17/11 12:00 AM						
AFR (1st year Weibull)	2.621%	From all fails Weibull MLE	1360	QTY TESTED					
MTBF (1st year Weibull)	90371.8								
Minimum AFR:	0.039%	From zero fail Weibull @ 50% CL	2400	POH/Year					
Total Number of Failures	47		0.63955018	Weibull Beta					
AFR for 1 failure	0.055%	AFR decrease per failure @ 100% fix effectiveness	953	Average Test Hours					
Issue	Corrective Action	Fix Validation	# of Failures	% Fail	Eff. Factors		Reduced AFR		PFL/TF
					Demo'd	Potential	Demo'd	Potential	
SPPL-110: Skip Write Due to Contamination on Alpha-1D Configuration	SSO For Alpha 1Disk Configuration in place on 9/20	1D / Alpha SSD in place in the factory on 9/19	18	0.989%	100%	100%	1.687%	1.687%	PFL-2232/339,PFL-2231/823,PFL-2226/332,PFL-2305/680,PFL-2086/64,PFL-2016/160,PFL-2201/689,PFL-2114/436,PFL-2199/410,PFL-2064/10,PFL-2060/268,PFL-2034/189,PFL-2193/321,PFL-2157/553,PFL-2170/293,PFL-2092/373,PFL-2091/94,PFL-2321/736
SPPL-108: 20kHz Loop Instability due to Incorrect SNO & TAN	3 Code Fixes Planned: 1. TAN Improvements. 2. SNO Picks in the process 3. Broad notch between 18-22	Validation in process on 10 failures.	10	0.549%	100%	100%	2.126%	2.126%	PFL-2082/88,PFL-2081/245,PFL-2032/141,PFL-2057/190,PFL-2056/172,PFL-2024/74,PFL-2026/112,PFL-2014/80,PFL-2015/63,PFL-2309/918
SPPL-111: Degraded Head - RDT 3,4,5	3 of 4 Deg Heads have TA interaction. TA/Defect reduction plan in process with RMD. PFL2074: Combination Spec for TA Count + P_AFH_DH_BURNISH_CHECK - PC0 16.1 on wwl	Cutin for TA Spec & Delta Burnish in PC0 16.2	5	0.275%	15%	40%	2.580%	2.511%	PFL-2314/887,PFL-2205/666,PFL-2074/265,PFL-2058/242,PFL-2195/577
SPPL-113: Particle Induced Media Damage	Improved General Cleanliness Actions and MQM change for Bode shake as part of particle sweep in CRT2 on 6 Head only.		3	0.165%	0%	20%	2.621%	2.588%	PFL-2127/412,PFL-2197/590,PFL-2002/73
SPPL-117: Skip Write - RDT 3/4/5	Skip Write Detect sensitivity adjustment. wwl4 for testing. One skip write easily caught with a negative burnish spec in cert. Discussing implementation. Particle Improvements for contamination related skip write	Cutin for S/W sensitivity adjustment - PC0 16.2	3	0.165%	15%	40%	2.596%	2.555%	PFL-2256/756,PFL-2159/535,PFL-2199/645
Modulation	FA In Process		1	0.055%	50%	50%	2.566%	2.566%	PFL-2322/755,PFL-2321/736
SPPL-116: S/WOT - RDT 3/4/5	Servo code 88C		2	0.110%	0%	80%	2.621%	2.533%	PFL-2061/176,PFL-2148/438
SPPL-105: Weak Write - Process Escape with PC013 Not Reporting Data	Fix for PC013 not reporting all heads in the IOSC2 Weak Write screen	Validated fix is in PC0 12.4	1	0.055%	100%	100%	2.566%	2.566%	PFL-1956/0
SPPL-109: Head Instability due to Interaction with FAFH Tracks	Remove FAFH Tracks in PC0 12.4	Drive Passed Retest. Head will go to RHO for further FA	1	0.055%	40%	40%	2.599%	2.599%	PFL-1999/31
SPPL-114: IOEDC due to incorrect VBM Index	New 'bread crumb' code developed to dump out ECC fields. Have not performed board swap piece (Winbond DRAM) Customer data not lost		1	0.055%	0%	0%	2.621%	2.621%	PFL-2070/31
SPPL-118: Seek Timeout due to incorrect ACFF coeff during Single to Dual Stage Transition	Servo code 88B that blends the integrator value when transitioning from Single to Dual stage.	Validation on failures from RDT3/4/5	1	0.055%	90%	100%	2.571%	2.566%	PFL-2150/259
SPPL-119: Weak Write - RDT 3,4,5	VBAR by HMS Phase 4	VBAR/HMS Phase 4 - PC016.2	1	0.055%	40%	40%	2.599%	2.599%	PFL-2127/452
Total Number of Fails			47	Reduced AFR :		0.87%	0.63%		
				Corresponding MTBF :		275K	378K		



Confidential







# Grenada Materials SAD Risk

October 03, 2011  
Bob Kolanda



## 1D Alphana MBA / ID Skip Write

Alphana 1D MBA is on stop build due to ID skip writes seen in RDT3. Currently 10 failures, TTF ranges from ~60hrs to 550hrs.

Alphana Re qual activity based on higher amounts of hydrocarbons v Nidec resulting in a new cleaning process. Included is an improved VMI screening process @ the hub level

Drive build 10/07 (WW14), ECD risk approval WW18 earliest.

Supply at risk beginning WW19 based on latest Factory outlook. Team working with Nidec to provide demand coverage through calendar year end. Current gap is motor sub components, continuing to work with Nidec for improvement

**Risk to proceed high based on current supply outlook and no actual root cause determination**

## Compart Re qual – SSO for 13.6khz issues seen in RDT2

### 3D Supply shortfall beginning FQ3'11

3D re qual build completed, yielded 166 v 225 required for qual bed. Not a Compart related failure

Top off builds and retest of failures underway

Pending results of the testing above, an RDT type qual would be staged to support a qual by mid December

**1D and 2D qual** - Completion estimated for Early January'12. No supply shortfall estimated as we are dual sourced on those impacts with Belton and FEL

## EC11225 3D failure (CRRO) – Disc Spacer

4 leg DOE Completed. Results indicate little difference in yield between standard incoming and “no ding” screened. However, there is ~ 3% difference between Dufu and Global. Global being the better of the two

Dufu has been placed on stop build with Grenada pending discovery and resolution of the disparity. There is no supply shortfall based on Factory planner analysis of moving Dufu to Bogart and Muskie.

Next Steps include Root cause determination, improved VMI spec possibilities and mechanical change to edge radius

- **Note:** Evaluation is underway with Muskie at this time to determine any impact with Dufu. Results could influence overall supply picture
  - **Moderate Risk based on current inventory position**
  - **TI Preamp – 4ch and 6ch qualification for Mass Pro**
  - Qual in progress (RDT4). ECD qual timeout WW14
  - Currently 2 SWOT failures in the Bed under root cause investigation. Full approval gated by root cause determination
  - Supply coverage is currently 100% LSI through the end of this calendar year. Will re address supply capacity if required based on root cause
- **Overall Recommendation** - Proceed to SAD and continue to expedite Re Qual activities on Critical items listed. Monitor supply outlook on Alphana and Compart through Qual.



### Grenada 1D MBA Q2

WORK WEEK DATE	EOH	14 1-Oct	15 8-Oct	16 15-Oct	17 22-Oct	18 29-Oct	19 5-Nov	20 12-Nov	21 19-Nov	22 26-Nov	23 3-Dec	24 10-Dec	25 17-Dec	26 24-Dec	Q2 12
<b>TOTAL INSERTION</b>		<b>6129</b>	<b>0</b>	<b>0</b>	<b>138269</b>	<b>202504</b>	<b>232536</b>	<b>280644</b>	<b>102438</b>	<b>201264</b>	<b>153821</b>	<b>147325</b>	<b>128479</b>	<b>109961</b>	<b>1703369</b> <b>0</b>
Nidec RAF Commit 9/16		0	0	0	40000	40000	40000	40000	40000	40000	40000	40000	40000	20000	<b>380000</b>
Nidec NCC Commit 9/16		7000	7000	7000	42000	42000	42000	42000	35000	35000	35000	70000	70000	35000	<b>469000</b>
Alphana Commit 9/12		0	0	0	0	0	0	0	0	0	0	0	0	0	<b>0</b>
		0	0	0	0	0	0	0	0	0	0	0	0	0	<b>0</b>
<b>Total Commit</b>		<b>7000</b>	<b>7000</b>	<b>7000</b>	<b>82000</b>	<b>82000</b>	<b>82000</b>	<b>82000</b>	<b>75000</b>	<b>75000</b>	<b>75000</b>	<b>110000</b>	<b>110000</b>	<b>55000</b>	<b>849000</b>
BOH (HUB only)	<b>231790</b>	232661	239661	246661	190332	69888	-80648	-279292	-306730	-432934	-511815	-549140	-567619	-622579	
Inventory Level (Days)	264.71	#DIV/0!	#DIV/0!	12.49	6.58	2.10	-2.01	-19.09	-10.67	-19.70	-24.32	-29.92	-36.13	-16.92	

### Bacall MBA Q2

WORK WEEK DATE	EOH	14 1-Oct	15 8-Oct	16 15-Oct	17 22-Oct	18 29-Oct	19 5-Nov	20 12-Nov	21 19-Nov	22 26-Nov	23 3-Dec	24 10-Dec	25 17-Dec	26 24-Dec	Q2 12
<b>TOTAL INSERTION</b> (With drives yield)		<b>14926</b>	<b>21233</b>	<b>6717</b>	<b>11195</b>	<b>9702</b>	<b>8956</b>	<b>6090</b>	<b>4263</b>	<b>7917</b>	<b>2842</b>	<b>2842</b>	<b>2111</b>	<b>23916</b>	<b>122711</b>
Nidec RAF Commit															<b>0</b>
Nidec NCC Commit		12000	18000	18000	18000	7000	7000	0	4000	4000	4000	4000	10000	10000	<b>116000</b>
Alphana Commit		0	0	0	0	0	0	0	0	0	0	0	0	0	<b>0</b>
<b>Total Commit</b>		<b>12000</b>	<b>18000</b>	<b>18000</b>	<b>18000</b>	<b>7000</b>	<b>7000</b>	<b>0</b>	<b>4000</b>	<b>4000</b>	<b>4000</b>	<b>4000</b>	<b>10000</b>	<b>10000</b>	<b>116000</b>
BOH (HUB only)	<b>7000</b>	4074	841	12124	18929	16227	14271	8181	7918	4001	5159	6317	14206	289	
Inventory Level (Days)	2.31	1.34	0.88	7.58	13.66	12.68	16.40	13.43	7.00	9.85	12.71	20.94	4.16	0.07	



- **Built a DOE of Alpha 1D MBA's and ST McKinley Servo ASIC**
  - **200 Control 1D Alpha MBA with JCY base deck WW47 (RDT3)**
    - **PCO12.6 and run with current PWM 58KHz**
  - **200 Clean 1D Alpha MBA with JCY base deck**
    - **PCO 12.6 half with PWM 58KHz and half with PWM 69KHz**
  - **200 Clean 1D Alpha MBA with MMI base deck**
    - **PCO 12.6 run half with PWM 58KHz half with PWM 69KHz**
  - **69KHz PWM code in cert checkout done looks fine**
  - **Drives testing in Suzhou 10/17 and decision pt 10/28**
  - **We now have TI version code in checkout as well.**



1) **BP4 / 20A** : This is approved for SBS only with MTBF at 127K.

- S6 (Native) : 0.7M HGAs
- S5 (BtC) : 1.1M HGAs
- HSA : 34K - 2HD , 35K - 4HD , 29K - 5HD and 38K - 6HD

2) **BP4.5 / 20A** : This is approved for SBS only. There is no specific MTBF data on this material as only an interim plan for BP4.5/22A.

- S6 (Native) : 200K HGAs
- S5 (BtC) : 140K HGAs
- HSA : 2.7K-2HD , 0.3K-4HD , 0.4K-5HD and 1.2K-6HD

3) **BP4.5 / 22A** : Under qualification for Disty. MTBF as of Sep 27 (491-hr test time) is 185K validated (245K potential).

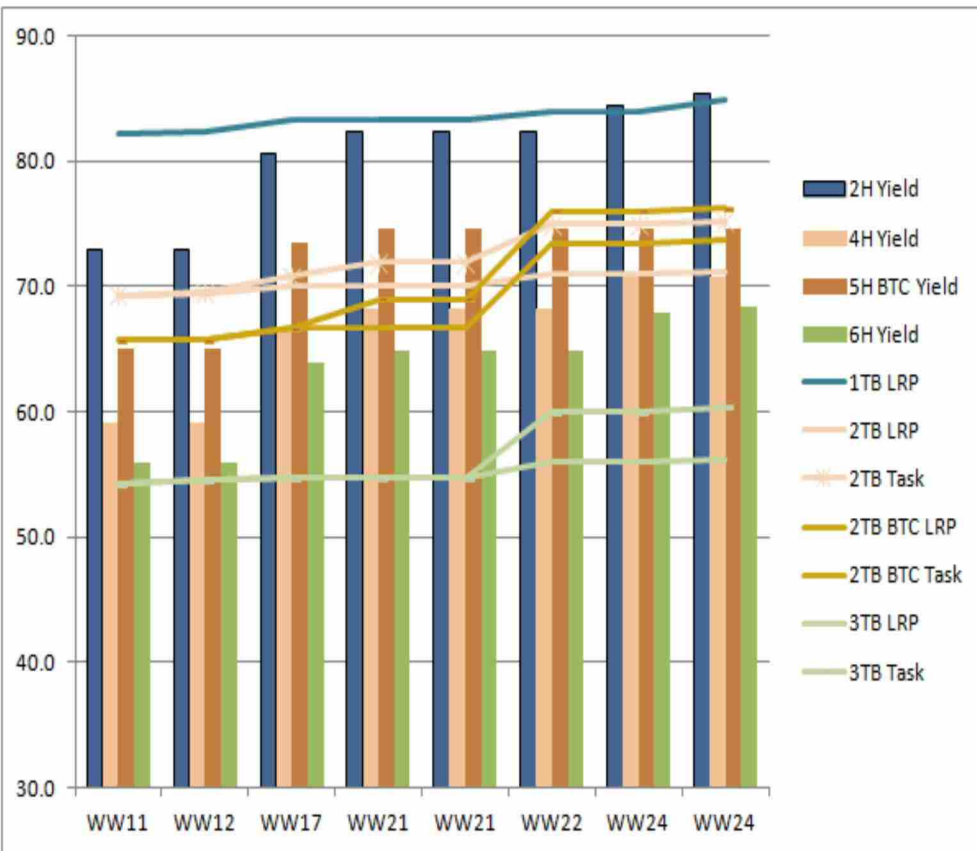
- 500-hr check point by W13/14 and 1000-hr by W16.
- Slider cut in 22A on Sep 9.
- Under material team to review for the Disty supply ramp plan with BP4.5/22A , est Sep 29 due to Teparuk shut down.

--  
-

# Grenada YIP Migration

BP 4.5 22A 100% Cut In Date Change

- Sort 6 WW25, Sort 5 WW24



Task - Yield Goal Increase

- 2TB meets LRP WW36

- PCO 12.3 yield is baseline.
- PCO 16 target release WW14, cut in MassPro WW17.

	PCO12.3 BP4 20A DLC + 3D Waterfall Opti		PCO 12.4 Bug Fix	PCO16 BP4 20A DLC MassPro Candidate		PCO17.0	BP4.5 HGA Spec Opti BTC	BP4.5 22A DLC (WW23 BTC)	BP4.5 HGA Spec Opti Native	BP4.5 22A DLC (WW17 Native)
	Q 1		Q 2							
MassPro	WW11	WW12	WW17	WW21	WW21	WW24	WW24	WW25		
2H Yield Gain	2.9		7.6	1.8			2.0	1.0		
4H Yield Gain	4.1		7.4	1.8			2.5	0.0		
5H BTC Yield Gain	6.1		8.5	1.1			0.0	0.0		
6H Yield Gain	9.7		7.9	1.1			3.0	0.5		
	WW11	WW12	WW17	WW21	WW21	WW22	WW24	WW24		
2H Yield	73.0	73.0	80.6	82.4	82.4	82.4	84.4	85.4		
1TB LRP	82.2	82.4	83.4	83.4	83.4	84.0	84.0	84.9		
4H Yield	59.1	59.1	66.5	68.3	68.3	68.3	70.8	70.8		
2TB LRP	69.2	69.4	70.0	70.0	70.0	71.0	71.0	71.2		
2TB Task	69.3	69.6	70.8	72.0	72.0	75.0	75.0	75.2		
5H BTC Yield	65.1	65.1	73.6	74.7	74.7	74.7	74.7	74.7		
2TB BTC LRP	65.7	65.7	66.7	66.7	66.7	73.5	73.5	73.7		
2TB BTC Task	65.7	65.7	66.7	69.0	69.0	76.0	76.0	76.3		
6H Yield	56.0	56.0	63.9	65.0	65.0	65.0	68.0	68.5		
3TB LRP	54.2	54.5	54.7	54.7	54.7	56.0	56.0	56.2		
3TB Task	54.2	54.5	54.7	54.7	54.7	60	60	60.4		
Meeting Current LRP										

Confidential



# Grenada Test Time

	PCO 9.8	PCO 12.6A	PCO 16.1	PCO 17	PCO 18	PCO 19
Action / WW	N	14	17	21	25	29
1TB Actual TT w/o MQM	46.3	43.2	42.2			
1TB Actual TT w/MQM	50.7	47.2	46.2			
1TB Actual SP	44.2	38.1	37.9			
1TB Actual IP	2.1	5.1	4.3			
1TB Actual IP MQM	4.4	4.0	4.0			
1TB LRP IP	1.6	1.6	1.6	1.6	1.5	1.5
1TB LRP SP	38	38	38	38	36.2	36.2
DELTA LRP	6.7	3.6	2.6			

	PCO 9.8	PCO 12.6A	PCO 16.1	PCO 17	PCO 18	PCO 19
Action / WW	N	14	17	21	25	29
2TB Actual TT w/o MQM	82.2		82.8			
2TB Actual TT w/MQM	88.8		90.0			
2TB Actual SP	78.9		77.6			
2TB Actual IP	3.3		5.2			
2TB Actual IP MQM	6.6		7.2			
2TB LRP IP	2.0	2.0	2.0	2.0	1.9	1.9
2TB LRP SP	73.2	73.2	73.2	73.2	69.7	69.7
DELTA LRP	7.0		7.6			

	PCO 9.8	PCO 12.6A	PCO 16.1	PCO 17	PCO 18	PCO 19
Action / WW	N	14	17	21	25	29
2TB 5HD Actual TT w/o MQM	101.7	95.6				
2TB Actual TT w/MQM	108.7	103.0				
2TB 5HD Actual SP	97.8	89.4				
2TB 5HD Actual IP	3.9	6.2				
2TB BTC Actual IP MQM	7.0	7.4				
2TB BTC LRP IP	2.2	2.2	2.2	2.2	2.1	2.1
2TB 5HD LRP SP	83.9	83.9	83.9	83.9	79.9	79.9
DELTA LRP	15.6	9.5				

	PCO 9.8	PCO 12.6A	PCO 16.1	PCO 17	PCO 18	PCO 19
Action / WW	N	14	17	21	25	29
3TB Actual TT w/o MQM	132.8	119.1				
3TB Actual TT w/MQM	139.6	128.2				
3TB Actual SP	129.3	112.1				
3TB Actual IP	3.5	7.0				
3TB Actual IP MQM	6.8	9.1				
3TB LRP IP	2.4	2.4	2.4	2.4	2.3	2.3
3TB LRP SP	108.4	108.4	108.4	108.4	103.2	103.2
DELTA LRP	22.0	8.3				

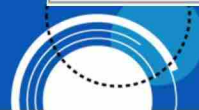
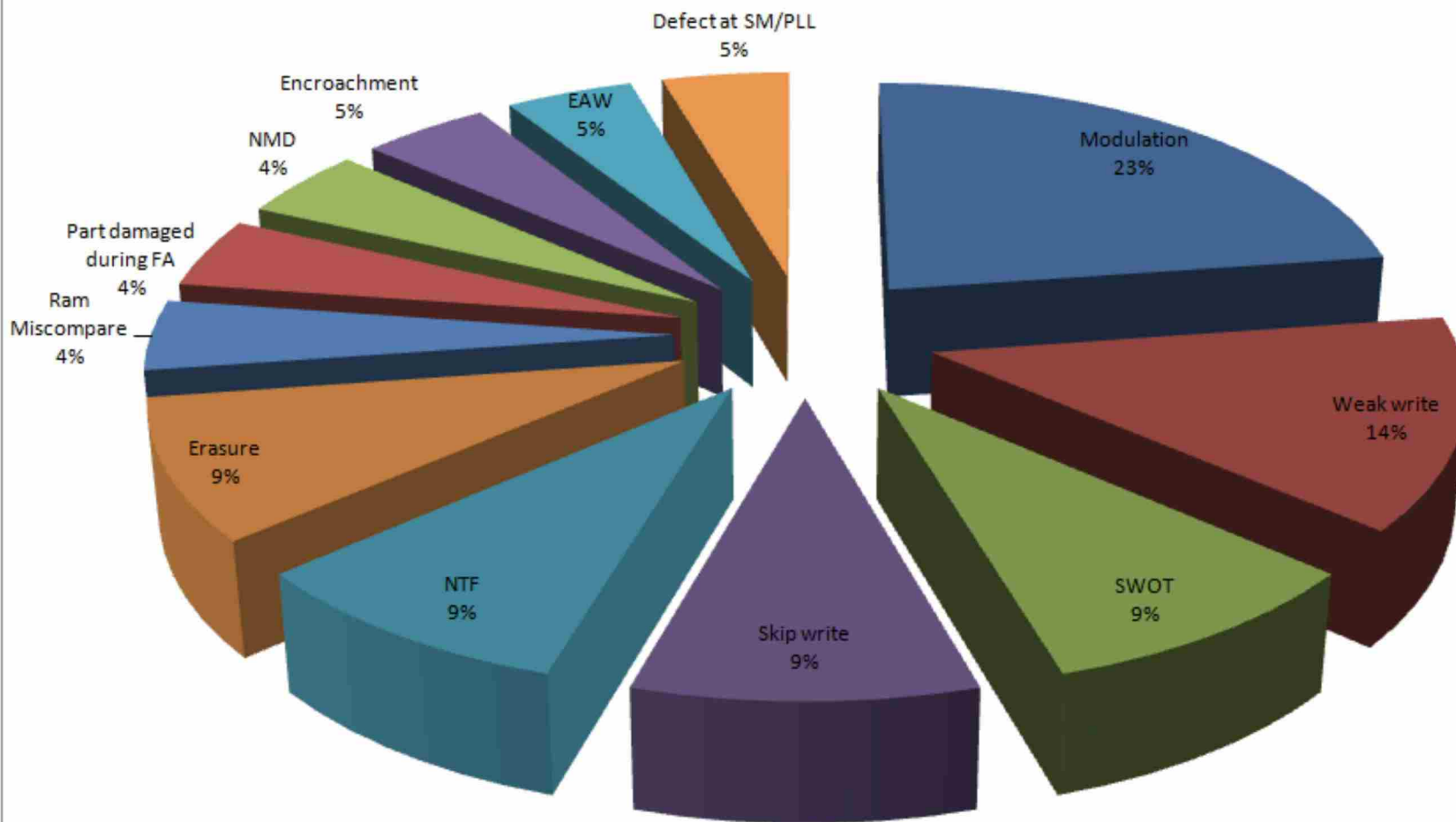
PCO 17 Test time Reduction will be underpinned 10/12.

Confidential





## 4Weeks OBT failure Count FW1209 ~ FW1212



# Cleanliness Time line

		Sept				Oct				Nov				Dec				Jan				
Improvements post RDT3		FW10	FW11	FW12	FW13	FW14	FW15	FW16	FW17	FW18	FW19	FW20	FW21	FW22	FW23	FW24	FW25	FW26	FW27	FW28	FW29	FW30
Components																						
	Slider																					
	192 KHz post DEB Airknife						X	X														
	Post SFAVI Tooltek+No SA superheat+IPA Texwipe/HTC tray cleaning					X																
	Auto 192 Khz.				X																	
	HGA																					
	Pneumatic exhaust release to facility/Vacuum cleaning nozzle for FOLA/BOLA	tbd																				
	Auto cleaning for SLA pre-align gripper and mount finger	tbd																				
	Non-ABS clamping at TIC	tbd																				
	HSA (Rapeepat)																					
	Expandable spacer key (80% tape test)																					
	Tolerance ring install					X																
	HAS Workstation cleaning frequency																					
	Dip clean to end of process	tbd				X																
	Media																					
	Desaru media talc.. Do we have it, Candella..																					
	MBA cleanliness spec																					
	Would need new drawing, and re-quote	Olivero																				
Assembly/Factory																						
	Parts																					
	Clean room paper frocess!!!			X																		
	MonocastSpacer cleaning rack		K, S,W									X										
	FOF																					
	Pad (spec revision/review)								W,K													
	RT-PAD (improved detection and sample rate)	K.S. confirm Wx			1D		K,W	S														
	PAD sampling rate to 1%			X																		
	Add stopper to Qcover (SST3xx and AI) (Sz and Wx in RDT3, Korat new)				K,S																	
	Weekly cleaning for RPI station (ramp rotate)			K																		
	Clover leaf. Lots of particles at disk loader (SST)			W	S									K								
	Design																					
	header connector cover																					
Test Process																						
	MQM																					
	MantaRay Particle Agitation							X														
	implemented																					
	planned																					
	not planned																					



# Complexity Matrix – PSG Grenada

Case 3:16-cv-00513-JCS Document 151-2 Filed 11/05/18 Page 23 of 29

Grenada Customer and Internal Restriction Matrix								
Customer		HP	Dell	Lenovo	Apple	STD OEM	SBS	Disty
FY12 Volume								
Balance Control		FBP1<12.5			1D:FBP2<14.0 2D: FBP2<21.0			
PCBA	Chip							
	Type	RVFF						
HSA	NHK/MPT Suspensi on							
	Sort /head type							
	TI / LSI Preamp							
Media								
MBA								
Customer Special Test		10G screen, 1M0s	Dell PPID		Blue nun test ATI test (7hrs/Disc)	Dell PPID		
Cover								
GOTF		OEM	OEM	OEM	OEM	OEM		
Mfg Site					No Suz			
F3 Code		HP01	CCD4	CCD6	AP01	CCD4	CCD9	CCD4
Labels	Drive Label							
	Case Label							
Others					2TB 4H HDA only			

Grenada Complexity Ratio (CR):  
Grenada Customer Complexity Ratio (CCR):

Remark:

	No restriction on this part
	Customer restriction on this part
	Seagate restriction on this part (without action)
	Seagate restriction on this part (with action)

Potential future Risks:

1. Fuji media FQ2'12 to BP FQ4'12
2. TDK heads disty only FQ3'12 to BP FQ4'12
3. Sony screen to meet DPPM if required

Opportunities: Move SBS to CCD4, current issue is thermal limits with CCD4 JIT mode



CC Summary		
Actual	0	
Budget	80	Commit at Phase 0
Forecast	54	Current Forecast
Delta	26	Budget minus Forecast
CH Index Summary		
Actual	0	
Budget	296	Commit at Phase 0
Forecast	90	Current Forecast
Delta	206	Budget minus Forecast
CH Ratio Summary		
Actual	0.00	
Budget	3.70	Commit at Phase 0
Forecast	1.67	Current Forecast
Delta	2.03	Budget minus Forecast

BASE CONFIGURATIONS			
Capacity	Cache	Interface	Configs
3000	1	1	1
2500	1	1	1
2000	1	1	1
1500	1	1	1
1000	1	1	1
750	1	1	1
6 Standard Tabs			

Configuration Driver Report		Total
Base Number of Configurations: SBS		6
Customer Unique Code Apple, HP, Dell, Lenovo,		24
Customer Unique Labeling: Std OEM. Japanese OEMs		12
Disty: Seagate/ Maxtor		12
Total Configurations		54

## Risks:

- NEC, Sony and Samsung dppm and FW changes that could occur during qualification
- Dell on Std OEM at launch, FW improvements learned during qualification





# Grenada Restrictions Report

## Current Restriction Report

Restriction Category	Restriction Detail	Reason Category	Qty of Restr	Weight	CC's Affected	CHI Score	Action	Owner
HDA Restriction		Customer Unique Requirement	0	7	0	0	Top cover damper not on Disty and SBS for cost savings	NA
HDA Restriction		To Meet Customer Quality Requirements	0	7	12	0	Top cover damper not on Disty and SBS for cost savings	NA
PCBA Restriction		Implement Cost Savings	0	3	12	0	Non-LH PCBA for cost savings on Disty and SBS	NA
PCBA Restriction		Customer Unique Requirement	0	3	0	0		NA
PCBA Restriction		To Meet Customer Quality Requirements	0	3	0	0		NA
PCBA Restriction		Customer Unique Requirement	0	3	0	0		NA
PCBA Restriction		Customer Unique Requirement	0	3	0	0		NA
Test Screen Restriction	Apple requires Blue Nun test	Customer Unique Requirement	1	3	12	36	None	NA
Test Screen Restriction	Apple require full pack zero pattern format	Customer Unique Requirement	1	3	12	36	None	NA
Test Screen Restriction	HP 20M Zeros 1st and last	Customer Unique Requirement	1	3	6	18	None	NA
Top Cover Restriction		Customer Unique Requirement	0	7	0	0		NA
Test Screen Restriction		Customer Unique Requirement	0	3	0	0		NA
	Total Active CCs	54	Complexity Health Index			90		
	Total CCs affected	54	Complexity Health Ratio			1.67		
	Unrestricted CCs	0						
	Total Restrictions	3						
	Closed Restrictions	0						
	Restrictions with closure plan	0						
	Restrictions that require closure plan	0						
	Non-Closeable due to Customer/Marketing Requirement	3						
	Non-Closeable due to Cost Savings / Other	0						



PFL	TTF	Issue	PFL Cnt	Hds	Build Site	Test Site	Status	Drive Location	RC Investigation / Corrective Actions	CA Cut-in Date	Responsible
2014	80	20KHz Servo Resonance	10	4	WUX	SUZ	Multiple skipped tracks due to	SUZ Retest (316 hrs)	1. Broad notch servo code running in retest on 9 failures in Suzhou reli - SFW8A in PCO14.x targeting Tier 2 CTUs. 2. SFW89 has PF3 SNO fix and TAN change in PCO14.1	WW13	Bill Ray / Sandeep Sequeira
2015	63			4	WUX	SUZ	dVGAS and 22KHz in PES. Many seek	SUZ Retest (316 hrs)			
2024	74			5	TTK	SUZ	errors to head 1 and NRRO vibration	SUZ Retest (320 hrs)			
2026	111			4	WUX	SUZ	detect messages. Bode plots show	SUZ Retest (316 hrs)			
2033	140			5	TTK	SUZ	that Servo notch is not centered	SUZ Retest (318 hrs)			
2056	172			5	TTK	SUZ	over resonance mode at 21KHz. SNO	SUZ Retest (291 hrs)			
2057	190			5	TTK	SUZ	peak detect set-up issue that	SUZ Retest (291 hrs)			
2081	245			5	TTK	SUZ	detects the Max rather than the	SUZ Retest (200 hrs)			
2016	160	ID Skip Write (Multi-Rev Offtrack Writes)	16	2	SUZ	SUZ	H0/H1 Extreme ID. Same symptoms	LCO CIL	Stop Ship issued for Alphana Motor Base. Planning a 100 drive Grenada Clean Hub check out in reli test.	WW12	Scott Deits / Kevin Gorgen
2034	189			2	SUZ	SUZ	and emap modulation signature at	LCO HMM			
2060	268			2	SUZ	SUZ	extreme ID seen on other PFLs (PFLs	LCO HMM			
2064	10.4			2	WUX	TTK	1923, 2027), all with Alphana MBA	LCO HMM			
2086	63			2	SUZ	TTK	(LR). Investigation in progress.	LCO 9/22			
2091	94			2	WUX	TTK	Bacall also has 6 PFLs. Drives	LCO HMM			
2092	373			2	SUZ	SUZ	progressing through teardown, CIL	LCO HME			
2114	435			2	SUZ	SUZ	and RHO FA.	LCO SVO			
2157	552			2	SUZ	SUZ		LCO 10/14			
2159	534	MD Skip Write	1	4	TTK	SUZ	2159 - H2 Zone B. Modulation in emap. OTF sags in the MD area. Cert data shows this to be a clearance outlier from AFH2 to AFH3 Clearance loss of >10A. <u>Teardown shows no interaction on disc. Head in SEM analysis ECD 10/11</u>	LCO HMM	Possible cert screen analysis pending physical FA.	TBD	Scott Deits / Kevin Gorgen
2102	14	Skip Write	3	6	TTK	LCO	2102 - H0 (Zone 5). Alphana MB. Media shows lube modulation.	RHO FA	2102 -Hydrocarbons identified on CP TE - exact source undetermined. Basedeck and disc wash in process ECD 10/11 2198 - New Failure. In shipment to LCO. 2256 - New Failure. In shipment to LCO.	TBD	Scott Deits / Kevin Gorgen
2198	645			4	TTK	SUZ	Heavy smearing with unspecific hydrocarbons found on head.	LCO 10/10			
2256	755			6	TTK	SUZ	2198 - H0 (zone 1C). Alphana MB. Shipping to LCO. 2256 - H0 (Zone ) Alphana MB. Shipping to LCO.	LCO 10/17			

Still running.

DOE in progress to potentially clear inventory: Alphana clean hubs, standard, and new PWM.

**Deits 4-UP.** Able to screen with <1% yield loss, looking for further efficiencies. 10A negative burnish. Talc on AAB. **Particle improvement.**

**Deits 4-UP.** Alphana non - 1D skip writes. 2 of 3 are at ID somewhat similar to the 1D.

# RDT3 Pareto

2137	451	Weak Write	1	3	TTK	SUZ	2137 H1 at OD. Nidec MBA. On bench, duplicate error at BBM 3/10 with Y1 full retry. Error written over in MSD check. Similar errors show media once-around issue. Reprocess drive with PCO 16 to validate VBAR by HMS.	LCO HME	CA Identified: VBAR by HMS phase 4 in PCO16. Drive being reprocessed with PCO16 to validate.	TBD	Scott Deits / Krishnan
2058 2074 2195 2205	242 265 577 665	Degraded Head	4	6 4 4 2	SUZ WUX TTK TTK	SUZ SUZ TTK SUZ	2058 - H2 amplitude increased and high asymmetry change since cert and BER degraded. Non-resettable. Small amount of burnish on reader. 2074 - H2 amplitude decrease and BER degraded MR resistance. increase 80 ohms. Over 500 sev 2 TAs on S2. DLC completely worn off. ISI looked okay. 2195 - Sudden degradation on H1. Amplitude doubled and asymmetry increased. Running QST and Hd Instability test. Shipping to LCO. 2205 - MR resistance H0 degraded at 400 hrs into test.	LCO CIL LCO CIL LCO 10/10 SUZ FA	PFL-2074 CA Identified: Combo Spec between DELTA_BURNISH_CHECK and Total TA's. Option to ADG head, depop and reprocess.	TBD	Scott Deits
2099 2101	30 7	OD Skip Write	2	5 3	TTK TTK	LCO LCO	2099 - 20KHz modulation. Nidec MB. Re-calibration picked lower dygas threshold in the zone with the skip write. Drive being reprocessed to check SWD at FNC2 and to recheck SWD sensitivity. ECD 10/10 2101 - Nidec MB. Disc showed lots of evidence of HDI at OD. Lube moguling at OD and ID.	LCO HMM LCO CIL	2099 - SWD moving to FNC2 after ZAP in PCO14.1 2101 - PIDs on failing surface. CA from RHO slider pending.	TBD	Scott Deits / Kevin Gorgen
2002 2127 2197	73 411 590	Particle/Contam Induced Media Defect	3	6 2 6	WUX TTK TTK	SUZ SUZ SUZ	2002 NMD - Failed during clean up for UDE after power interruption. Emap shows 2 track particle scratch. CIL found head to be clean. 2127 Erasure - Multitrack erasure on H0 zone16. No MSD signature. In LCO teardown - preliminary teardown results expected 9/30 2197 MSD - Multitrack scratch on H1 zone 1. Checking cert data for head degradation.	LCO CIL LCO CIL LCO 10/10	Improved General Cleanliness Actions and MQM change for Bode shake as part of particle sweep in CRT2 on 6 Head only.	TBD	Scott Deits / Kevin Gorgen
2104	80			2	TTK	LCO	2104 - Seagate HDD and H1 M...	LCO Seagate	In FA process. Drive is kept in...	TBD	Bill Dawl

In cert for vbar/hms4 capture analysis. New picks de-stress head. **PCO 16.1.**

**Deits 4-UP.** (1) captured by cert process. **PCO 16.1.**

**Deits 4-UP.** One drive in re-process, showed that sensitivity improved with calibration in FNC2. 2101 - PID. Pending. **PCO 16.1.**

Particle Improvement plan in **ongoing** update mode..



2104 2150	80 259	Seek Timeout	2	2 2	TTK WUX	LCO TTK	2104 - Seek errors on H0 and H1. No issues on bench at ambient. Investigation focusing on (1) 900Hz resonance that persists for 2 or more revs - thought to be pivot/flex mode. In Speaker Vibe beat up test to duplicate. 2150 - Failed seeks on H0. Bode plots okay. 10/10 Retesting in Reli.	LCO Servo LCO Servo	In FA process. Drives in beat up to duplicate before flashing servo code changes in 8B. (1) ACFF off until settle, (2) Single stage to dual stage blend during settle process.	TBD	Bill Ray / Sandeep Sequeira
2061 2148	176 438	SWOT	2	4 4	TTK TTK	TTK TTK	UDS shows a large > 40% offtrack write fault at time of error immediately following a shock sensor event. Shock-induced encroachments on bench showed no anomaly. Attempting to duplicate error by writing adjacent track (Servo Engr).	LCO Servo LCO Servo	In FA process.	TBD	Dave Olivero / Sandeep Sequeira
2100	31	ABS Modulation	1	5	TTK	LCO	300 KHz modulation on H3 zone 12. 9/29 started Retest	LCO Retest (97 hrs)	Improved General Cleanliness Actions and MQM change for Bode shake as part of particle sweep in CRT2 on 6 Head only	TBD	Scott Deits
1999	30	Head Instability	1	5	TTK	SUZ	Failed during clean up for UDE after power interruption. GST indicates H1 unstable. Errors caused by low freq pattern in adjacent FAFH track and head sensitivity. FAFH tracks overwritten to simulate removal. Drive passed subsequent reli clean up and is in retest in RDT. Head shipped to RHO for FA on 9/30.	LCO Retest passed (stopped at 104 hrs)	FAFH tracks removed in PCO14.1	W/W13	Krishnan Subramanian
2070	30	IOECC Error	1	2	WUX	TTK	Fails for timeout/IOECC because of exhausting retries in the search for the bad IOECC block. Drive failed again in retest with new IOECC fixed code. Logs indicate a multibit error that can not be corrected. Winbond DDR. Retesting in LCO reli with debug code generated to display buffer data of bad sector (Ed Fong).	LCO Retest (66 hrs)	Refailed in 9 hours with new IOECC fixed code AAA900. Logs indicate that it is an uncorrectable multibit error.	TBD	Pat Vincent- Adams / John Shaw
1956	0.015	Weak Write - Process Escape	1	2	SUZ	SUZ	Drive certed with PCO 13 did not have IOSC2 Weak Write Screen.	LCO HME	IOSC2 Weak Write screen in PCO12.3	W/W10	Steve Arnold

Total 48

With Servo, seeing some 900 hz on seek settle. New servo code blends SS to DS better, and activates ACFF after settle complete. **PCO 16.1?**

Under re-classification. Believe these are not 'mechanical pop' symptom. Moving to Deits, probably just re-run.

To teardown.

Ed Fong has drive.

New failure, 30 second seek timeout. Head suddenly goes unstable. Need more F/A.



# MTBF Pie Chart

